UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,007	09/11/2003	Everett A. Corl JR.	RPS920020032US1	8599

26675 7590 06/28/2007
DRIGGS, HOGG & FRY CO. L.P.A.
38500 CHARDON ROAD
DEPT. IRA
WILLOUGBY HILLS, OH 44094

EXAMINER	
WEINTROP, ADAM S	
ART UNIT	**PAPER NUMBER**
2145	
MAIL DATE	**DELIVERY MODE**
06/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/662,007	CORL ET AL.	
	Examiner	**Art Unit**	
	Adam S. Weintrop	2145	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13,15-31,34 and 35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,15-31,34 and 35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. **Claims 1-10 and 22-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Zenchelsky et al. (US 6,173,364) in view of Spinney et al. (US 6,226,267) and further in view of Sendrowicz (US 2003/0163554).

Regarding **claim 1**, Zenchelsky et al. discloses a method for managing traffic in a communications network comprising acts of: (a) providing, in a network device, a cache containing at least predefined characteristics associated with packets and actions paired with selected ones of said predefined characteristics (column 3, lines 63-67 and column 4, lines 1-2, where the key is a predefined characteristic and actions are paired together with it in the cache, the cache being used for filtering packets in a communication network, and is in a network device as seen in column 1, lines 51-59, a network device being a filter); (b) receiving at least one of the packets in said network device (column 1, lines 60-62); (c) selecting, from said received packet, characteristics similar to the at least predefined characteristics (column 1, lines 60-66); (d) correlating the characteristics selected from said received packet with the predefined characteristics (column 4, lines 2-6); and (f) identifying data packets with the most

bundling when compared to other data packets (column 4, lines 1-6, where the first packet received is part of a series of packets with the same key, seen as a bundle of packets). Zenchelsky et al. does not disclose using the results from the correlating step to perform Layer 3 or higher classification of the received packet; or initializing an expiration timer that controls a frequency at which the cache is aged, wherein the expiration timer corresponds to an expected burst interval of the identified packets. The general concept of using a cache containing predetermined packet characteristics and their associated actions to classify Layer 3 or higher packets is well known in the art as illustrated by Spinney et al. Spinney et al. teaches a system where packets classification is performed at Layer 3 or higher (column 2, lines 18-28, where the system classifies Layer 4 packets), and the system uses a cache table to classify packets by using already seen packets for assistance (column 8, lines 38-45, where a packets is hashed and matched against previous flows of packets). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zenchelsky et al. with Layer 3 or higher packet classification as taught by Spinney et al. in order to increase the efficiency of packet classification as to increase bandwidth to streaming applications as noted in Spinney et al.'s disclosure in column 2, lines 2-15. The general concept of initializing an expiration timer that controls a frequency at which the cache is aged, wherein the expiration timer corresponds to an expected burst interval of the identified packets is also well known in the art as illustrated by Sendrowicz. Sendrowicz describes a cache system for packet processing where entries in the cache are set to be deleted upon a average transmission time observed for the packet (section 0087,

section 0148, and section 0218, where the DD cache is used for discarding packets already seen by the cache, and the cache entry is created with a expiration time based on an average communication time, and this timer is updated as more cache hits are encountered, seen as setting an expiration timer for a cache entry using an expected burst time of the packet). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zenchelsky et al. and Spinney et al. with using cache expirations based on expected burst intervals as taught by Sendrowicz in order to control the cache entries and limit duplication of the packets as noted in Sendrowicz's disclosure in section 0244.

Regarding **claim 2**, Zenchelsky et al., Spinney et al., and Sendrowicz disclose the method of claim 1, and Zenchelsky et al. further teaches wherein the process includes enforcing the paired action against the received packet if the characteristics of said received packet matches the at least predefined characteristics (column 4, lines 6-8).

Regarding **claim 3**, Zenchelsky et al., Spinney et al., and Sendrowicz disclose the method of claim 1 or claim 2, and Zenchelsky et al. further teaches wherein the at least predefined characteristics include Internet Protocol (IP) Destination Address (DA), IP Source Address (SA), Transmission Control Protocol (TCP) Destination Port (DP) and TCP Source Port (SP) (column 2, lines 1-25, with the filtering being based on source address and port and destination address and port).

Regarding **claim 4**, Zenchelsky et al., Spinney et al., and Sendrowicz disclose the method of claim 1, and Zenchelsky et al. further teaches wherein the correlating act includes comparing (column 4, lines 2-3, wherein matching is equivalent to comparing).

Regarding **claim 5**, Zenchelsky et al. discloses a method comprising the acts of: providing in a memory a mapping of predefined characteristics associated with packets and actions to be performed (column 3, lines 63-67 and column 4, lines 1-2, where the keys are predefined characteristics and the action are paired together in the memory); receiving packets to be classified (column 4, lines 2-3); correlating selected characteristics of received packets with the predefined characteristics (column 4, lines 2-4); performing stored actions on said received packets, if the selected characteristics match the predefined characteristics (column 4, lines 6-8); and identifying data packets with the most bundling when compared to other data packets (column 4, lines 1-6, where the first packet received is part of a series of packets with the same key, seen as a bundle of packets). Zenchelsky et al. does not disclose having actions include Layer 3 or higher frame classification actions, or initializing an expiration timer that controls a frequency at which the cache is aged, wherein the expiration timer corresponds to an expected burst interval of the identified packets. The general concept of using a cache containing predetermined packet characteristics and their associated actions to classify Layer 3 or higher packets is well known in the art as illustrated by Spinney et al. Spinney et al. teaches a system where packets classification is performed at Layer 3 or higher (column 2, lines 18-28, where the system classifies Layer 4 packets), and the system uses a cache table to classify packets by using already seen packets for

assistance (column 8, lines 38-45, where a packets is hashed and matched against previous flows of packets, and then it is appropriately scheduled and routed, seen as actions). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zenchelsky et al. with Layer 3 or higher packet classification as taught by Spinney et al. in order to increase the efficiency of packet classification as to increase bandwidth to streaming applications as noted in Spinney et al.'s disclosure in column 2, lines 2-15. The general concept of initializing an expiration timer that controls a frequency at which the cache is aged, wherein the expiration timer corresponds to an expected burst interval of the identified packets is also well known in the art as illustrated by Sendrowicz. Sendrowicz describes a cache system for packet processing where entries in the cache are set to be deleted upon a average transmission time observed for the packet (section 0087, section 0148, and section 0218, where the DD cache is used for discarding packets already seen by the cache, and the cache entry is created with a expiration time based on an average communication time, and this timer is updated as more cache hits are encountered, seen as setting an expiration timer for a cache entry using an expected burst time of the packet). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zenchelsky et al. and Spinney et al. with using cache expirations based on expected burst intervals as taught by Sendrowicz in order to control the cache entries and limit duplication of the packets as noted in Sendrowicz's disclosure in section 0244.

Regarding **claim 6**, Zenchelsky et al., Spinney et al., and Sendrowicz disclose the method of claim 5, and Zenchelsky et al. further teaches wherein the correlating act includes comparing (column 4, lines 2-3, wherein matching is equivalent to comparing).

Regarding **claim 7**, Zenchelsky et al., Spinney et al., and Sendrowicz disclose the method of claim 5, and Zenchelsky et al. further teaches wherein the predefined characteristics include Source Address (SA), Destination Address (DA), Source Port (SP), and Destination Port (DP) (column 2, lines 1-25, with the filtering being based on source address and port and destination address and port).

Regarding **claim 8**, Zenchelsky et al., Spinney et al., and Sendrowicz disclose the method of claim 5, and Zenchelsky et al. further teaches wherein the received packets are data packets (column 2, lines 1-5, where the packets used for filtering are involved in application processes, seen as data packets)

Regarding **claim 9**, Zenchelsky et al., Spinney et al., and Sendrowicz disclose the method of claim 5, and Zenchelsky et al. further teaches wherein the stored actions associated with predefined characteristics are updated only from a first packet of a group of packets (column 3, lines 65-67 to column 4, lines 1-2, where a filter rules are applied only to a first packet in a message that shares a same key and the cache is updating only from the filter rule base).

Regarding **claim 10**, Zenchelsky et al., Spinney et al., and Sendrowicz disclose the method of claim 9, and Zenchelsky et al. further teaches wherein the stored actions are being performed on all packets following the first packet of the group of packets (column 4, lines 8-10).

Regarding **claim 22**, Zenchelsky et al. discloses a system including a memory that stores a mapping between predefined characteristics of packets and actions to be performed for a subset of the set of all characteristic values (column 3, lines 63-67, where the key is the predefined characteristic paired with an action, and the memory is derived from a filter rule base, therefore containing a subset of characteristics derived from already received packets); and a controller that performs the following actions: correlates characteristics in a received packet with the predefined characteristics and performing the actions on said received packet if the characteristics match the predefined characteristics (column 4, lines 2-8, where the received packet is searched against the predefined characteristics and the paired action is applied to the packet if a match is found). Zenchelsky et al. also discloses identifying data packets as being frequent flyer packets (column 4, lines 1-6, where the first packet received is part of a series of packets with the same key, seen as a series of packets). Zenchelsky et al. does not disclose actions that classify Layer 3 or higher packets, or initializing an expiration timer that controls a frequency at which the cache is aged, wherein the expiration timer corresponds to an expected burst interval of identified packets being frequent flyer packets. The general concept of using a cache containing predetermined packet characteristics and their associated actions to classify Layer 3 or higher packets is well known in the art as illustrated by Spinney et al. Spinney et al. teaches a system where packets classification is performed at Layer 3 or higher (column 2, lines 18-28, where the system classifies Layer 4 packets), and the system uses a cache table to classify packets by using already seen packets for assistance (column 8, lines 38-45,

where a packets is hashed and matched against previous flows of packets, and then it is appropriately scheduled and routed, seen as actions). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zenchelsky et al. with Layer 3 or higher packet classification as taught by Spinney et al. in order to increase the efficiency of packet classification as to increase bandwidth to streaming applications as noted in Spinney et al.'s disclosure in column 2, lines 2-15. The general concept of initializing an expiration timer that controls a frequency at which the cache is aged, wherein the expiration timer corresponds to an expected burst interval of the identified packets being frequent flyer packets is also well known in the art as illustrated by Sendrowicz. Sendrowicz describes a cache system for packet processing where entries in the cache are set to be deleted upon a average transmission time observed for the packet (section 0087, section 0148, and section 0218, where the DD cache is used for discarding packets already seen by the cache, and the cache entry is created with a expiration time based on an average communication time, and this timer is updated as more cache hits are encountered, seen as setting an expiration timer for a cache entry using an expected burst time of the packet or any repeat similar packet). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zenchelsky et al. and Spinney et al. with using cache expirations based on expected burst intervals as taught by Sendrowicz in order to control the cache entries and limit duplication of the packets as noted in Sendrowicz's disclosure in section 0244.

Regarding **claim 23**, Zenchelsky et al. discloses a computer readable medium comprising computer-executable instructions that, when executed by a processor,

produce a method that comprises: correlating characteristics of a received packet with characteristics in a table (column 4, lines 2-4, where a cache memory is searched for a matching entry, seen as characteristics in a table, when a packet is received), said table containing a subset of all possible characteristic values (column 3, lines 63-67, where the cache memory is derived from a filter rule base, therefore containing a subset of characteristics derived from already received packets); and enforcing an action stored in said table on the received packet if the characteristics of the received packet and the characteristics in the table match (column 4, lines 6-8, where the received packet is searched against the predefined characteristics and the paired action is applied to the packet if a match is found). Zenchelsky et al. also discloses identifying data packets as being frequent flyer packets (column 4, lines 1-6, where the first packet received is part of a series of packets with the same key, seen as a series of packets). Zenchelsky et al. does not disclose actions that facilitate Layer 3 or higher packet classification, or updating the contents of the table at times that correspond to an expected burst interval of identified packets being frequent flyer packets. The general concept of using a cache containing predetermined packet characteristics and their associated actions to classify Layer 3 or higher packets is well known in the art as illustrated by Spinney et al. Spinney et al. teaches a system where packets classification is performed at Layer 3 or higher (column 2, lines 18-28, where the system classifies Layer 4 packets), and the system uses a cache table to classify packets by using already seen packets for assistance (column 8, lines 38-45, where a packets is hashed and matched against previous flows of packets, and then it is appropriately scheduled and routed, seen as

actions). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zenchelsky et al. with Layer 3 or higher packet classification as taught by Spinney et al. in order to increase the efficiency of packet classification as to increase bandwidth to streaming applications as noted in Spinney et al.'s disclosure in column 2, lines 2-15. The general concept of updating a table that controls a frequency at which the cache is aged, wherein the expiration timer corresponds to an expected burst interval of the identified packets being frequent flyer packets is also well known in the art as illustrated by Sendrowicz. Sendrowicz describes a cache system for packet processing where entries in the cache are set to be deleted upon a average transmission time observed for the packet (section 0087, section 0148, and section 0218, where the DD cache is used for discarding packets already seen by the cache, and the cache entry is created with a expiration time based on an average communication time, and this timer is updated as more cache hits are encountered, seen as setting an expiration timer for a cache entry using an expected burst time of the packet or any repeat similar packet). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Zenchelsky et al. and Spinney et al. with using cache expirations based on expected burst intervals as taught by Sendrowicz in order to control the cache entries and limit duplication of the packets as noted in Sendrowicz's disclosure in section 0244.

Regarding **claim 24**, Zenchelsky et al., Spinney et al., and Sendrowicz disclose the computer readable medium of claim 23, and Zenchelsky et al. further teaches including instructions to generate the table containing the characteristics and associated

actions (column 3, lines 63-67 and column 4, lines 1-2, where generating the table consists of adding a cache entry for each first packet received).

3. **Claims 11-13 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US 5,842,040) in view of Spinney et al. (US 6,226,267) and further in view of Zaumen et al. (US 6,118,760) and further in view of Sendrowicz (US 2003/0163554).

Regarding **claim 11**, Hughes et al. discloses a system including a processor (column 2, lines 54-57); a cache operatively coupled to said processor (column 3, lines 36-39), said cache storing a mapping between predefined characteristics of packets and actions wherein said processor executes a first program that causes said processor to correlate characteristics of selected packets with the predefined characteristics (column 2, lines 57-60, where the policy is selected from a plurality of policies matched to the received PDU packet, these policies being seen as equivalent to characteristics of packets) and enforcing on said selected packets actions associated with predefined characteristics if characteristics from the selected packets match the predefined characteristics (column 3, lines 5-9, where the PDU has a policy applied to it from the policy cache). Hughes et al. does not disclose a memory operatively coupled to said processor and storing therein: a first data structure for a full packet search wherein said processor executes a second program that causes said processor to access the first data structure and imposing on said selected packet an action stored in said first data structure if a mismatch occurs between the predefined characteristics and the characteristics from the selected packets, or setting the expiration timer to correspond

to an expected burst interval of packets identified as frequent flyer packets. The general concept of including a data structure for a full packet search if a mismatch occurs is well known in the art as illustrated by Spinney et al. Spinney et al. describes a system that performs packet classification using a cache, but also uses a full table in the case of a cache table mismatch (column 7, lines 26-32, where the fast pattern matching is not appropriate or fails, the entire Hash table is used for packet lookup). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al. with full table lookup on cache lookup mismatch as taught by Spinney et al. in order to expedite the packet classification as to increase the efficiency of packet classification to increase bandwidth to streaming applications as noted in Spinney et al.'s disclosure in column 2, lines 2-15. Hughes et al. and Spinney et al. do not teach a second data structure that includes an aging algorithm for aging the cache, the aging algorithm initializes an expiration timer, decrements the expiration timer by a check time interval that is less than a current value of the expiration timer, reviews a Layer 3 or Layer 4 database for a change to the Layer 3 or Layer 4 database, and purges the cache if a change has been made during the check time interval, or setting the expiration timer on an expected burst interval of packets identified as being frequent flyer packets. The general concept of including such a timing algorithm is well known in the art as illustrated by Zaumen et al. Zaumen et al. describes a system for management of the cache memory. Zaumen et al. sets a first timer when a new block is created (seen as a expiration timer), and then starts a second timer (seen as a check time interval) when the first timer runs out if the block is still active. The process repeats

with every second time expiration, and in this process, the block is checked for its state of activity (seen as reviewing a database for changes in the database), and once it is inactive, the system deletes the entry if the entry in the database becomes inactive. This whole procedure is described in column 8, lines 21-51. Zaumen et al.'s system can be used for Layer 3 or 4 packets as noted in column 5, lines 7-11. It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al. and Spinney et al. with using an aging algorithm as taught by Zaumen et al. in order to efficient use of the memory available as noted in Zaumen et al.'s abstract. The general concept of initializing an expiration timer that controls a frequency at which the cache is aged, wherein the expiration timer corresponds to an expected burst interval of the identified packets being frequent flyer packets is also well known in the art as illustrated by Sendrowicz. Sendrowicz describes a cache system for packet processing where entries in the cache are set to be deleted upon a average transmission time observed for the packet (section 0087, section 0148, and section 0218, where the DD cache is used for discarding packets already seen by the cache, and the cache entry is created with a expiration time based on an average communication time, and this timer is updated as more cache hits are encountered, seen as setting an expiration timer for a cache entry using an expected burst time of the packet or any repeat similar packet, seen as a frequent flyer stream). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al., Spinney et al., and Zaumen et al. with using cache expirations based on expected burst intervals as taught by Sendrowicz

in order to control the cache entries and limit duplication of the packets as noted in Sendrowicz's disclosure in section 0244.

Regarding **claim 12**, Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz disclose the system of claim 11, and Hughes et al. further teaches wherein the predefined characteristics include Source Address (SA), Destination Address (DA), Source Port (SP) and Destination Port (DP) (column 5, lines 30-45, with the policies including filtering based on these criteria or any combination of criteria).

Regarding **claim 13**, Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz disclose the system of claim 11, and Hughes et al. further teaches wherein the processor includes a network processor (column 2, lines 50-57, with any network device including a processor can perform this process).

Regarding **claim 15**, Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz disclose the system of claim 11, and Hughes et al. further teaches having the packets used for caching include received packets as required by claim 15 (column 2, lines 63-65, with a PDU being a packet received).

4. **Claims 16-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US 5,842,040), Spinney et al. (US 6,226,267), Zaumen et al. (US 6,118,760), and Sendrowicz as applied to claim 11 above, and further in view of Bass et al. (US 6,460,120 B1).

Regarding **claim 16**, Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz disclose all of the limitations as described above except for using a full match algorithm to search the table. The general concept of using a full match

algorithm is well known in the art as illustrated by Bass et al. Bass et al. discloses frame lookups in a table using a fixed match tree (column 8, lines 1-3, where a fixed match tree requires an exact match, which is seen as being equivalent to a full match). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz with using a full match search algorithm as taught by Bass et al. in order to use known search algorithms to increase speed and flexibility as noted in Bass et al.'s disclosure in column 3, lines 18-20.

Regarding **claim 17**, Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz disclose all of the limitations as described above except for using a longest prefix match algorithm to search the table. The general concept of using a longest prefix match algorithm is well known in the art as illustrated by Bass et al. Bass et al. discloses frame lookups in a table using a longest prefix match tree (column 8, lines 1-5). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz with using a longest prefix match search algorithm as taught by Bass et al. in order to use known search algorithms to increase speed and flexibility as noted in Bass et al.'s disclosure in column 3, lines 18-20.

Regarding **claim 18**, Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz disclose all of the limitations as described above except for using software managed tree algorithm to search the table. The general concept of using a software managed tree algorithm is well known in the art as illustrated by Bass et al. Bass et al.

discloses frame lookups in a table using a software-managed tree (column 8, lines 1-8). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz with using a software managed tree search algorithm as taught by Bass et al. in order to use known search algorithms to increase speed and flexibility as noted in Bass et al.'s disclosure in column 3, lines 18-20.

Regarding **claims 19 and 20**, Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz disclose all of the limitations as described above except for having the memory internal or external to the processor. The general concept of placing the memory external or internal to a processor is well known in the art as illustrated by Bass et al. Bass et al. has memory external to the processors, but the combination of memory and processors create a network processor system (Abstract). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz with using memory external to the processor and also internal to the entire network processor as taught by Bass et al. in order to create a network processor in one physical unit as to save money and space, and increase the flexibility of the network processor as noted in Bass et al.'s disclosure in column 3, lines 18-20.

Regarding **claim 21**, Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz disclose all of the limitations as described above except for using a Direct Table and Patricia tree as the data structure. The general concept of using a Direct Table and Patricia tree is well known in the art as illustrated by Bass et al. Bass et al.

discloses a frame lookup method using a Direct Table and Patricia Tree (column 25, lines 54-61). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz with using a Direct Table and Patricia tree as taught by Bass et al. in order to use known data to increase speed and flexibility as noted in Bass et al.'s disclosure in column 3, lines 18-20.

5. **Claims 31 and 34-35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US 5,842,040) in view of "Filters to Detect, Filters to Protect" (McLachlan et al.) and further in view of Sendrowicz (US 2003/0163554).

Regarding **claim 31**, Hughes et al. discloses a method of classifying packets in a communications network comprising acts of: (a) receiving packets in a network device (column 2, line 61); (b) determining data packets present in received packets (column 3, lines 15-24, with grouping the packets together by any field could include TCP flag information as seen in column 5, lines 34-44, and this classification can inherently determine if it's a data packet or a non-data packet (data packets do not set the Synchronize flag or the Finish flag)); (c) providing a cache in which predefined characteristics of packets and actions associated with selected ones of the predefined characteristics are stored (column 3, lines 36-39, where policy data is seen as predefined characteristics); for each data packet so determined, correlating selected characteristics of said each data packet with the predefined characteristics in said cache (column 3, lines 27-31); and for each data packet with selected characteristics matching one of the predefined characteristics imposing on said each data packet the

action associated with said one of the predefined characteristics (column 3, lines 30-35, where policies are applied to matching packets with the matching policy information), wherein the packets include TCP/IP packets (column 14, lines 14-18), and wherein the determining act further includes the acts of: examining the control bits in the TCP header (column 5, line 41, where the TCP flags are found in the TCP header). Hughes et al. does not disclose if selected ones of the control bits are set to a first state, examining a length field in the IP header to determine its value, multiplying a value in the data offset field in the TCP header by 4, and subtracting the result of the multiplication from the value in the length field, or identifying packets as frequent flyer packets and updating the contents of the cache at times that correspond to an expected burst interval of packets identified as frequent flyer packets. The general concept of performing these mathematical operations to determine the TCP data if one of the control bits are set to a first state is well known in the art as illustrated by McLachlan et al. McLachlan et al, describes setting up a packet filter to discriminate or classify packets. On pages 9-10, McLachlan et al. describes the steps necessary to extract the TCP payload length. First, a check for a SYN flag is made, seen as a control bit being set to a first state, and then the TCP header length (seen as offset field) is multiplied by 4 and subtracted from the IP header length. It would have been obvious to modify Hughes et al. with extracting TCP payload information as taught by McLachlan et al. in order to examine fields in the TCP for certain kinds of activity as noted in McLachlan et al.'s page 1. The general concept of updating an expiration timer that controls a frequency at which the cache is aged, wherein the expiration timer corresponds to an

expected burst interval of the identified packets being frequent flyer packets is also well known in the art as illustrated by Sendrowicz. Sendrowicz describes a cache system for packet processing where entries in the cache are set to be deleted upon a average transmission time observed for the packet (section 0087, section 0148, and section 0218, where the DD cache is used for discarding packets already seen by the cache, and the cache entry is created with a expiration time based on an average communication time, and this timer is updated as more cache hits are encountered, seen as setting an expiration timer for a cache entry using an expected burst time of the packet or any repeat similar packet, seen as a frequent flyer stream). It would have been obvious to one of ordinary skill in the art at the time of invention to modify Hughes et al and McLachlan et al. with using cache expirations based on expected burst intervals as taught by Sendrowicz in order to control the cache entries and limit duplication of the packets as noted in Sendrowicz's disclosure in section 0244.

Regarding **claims 34-35**, Hughes et al., McLachlan et al., and Sendrowicz teach the method of claim 31 as described above, with McLachlan further teaching the first state being a logical "0" and having the selected ones of the control bits include SYN, FIN, and RST flags. The general concept of examining these control bits in the TCP header and checking to see if they are a logical "0" is well known in the art as illustrated by McLachlan et al. McLachlan et al. teaches checking for the SYN flag explicitly and then checking the TCP payload length, however this involves masking byte 13 of the TCP header to retrieve the control bits (page 7). The mask returns a number

corresponding to what control bits are set, and what control bits are at a logical "0". Byte 13 is displayed in Figure 17.5, and example mask returns are listed in page 8. This is seen as checking SYN, FIN, and RST flags and also determining logical "0's" before examining the TCP payload length. It would have been obvious to modify Hughes et al., McLachlan et al., and Sendrowicz with using any one of the selected TCP control bits and checking for a logical "0" before extracting TCP payload information as taught by McLachlan et al. in order to examine fields in the TCP for certain kinds of activity as noted in McLachlan et al.'s page 1.

Response to Arguments

6. Applicant's arguments with respect to claims 1-13, 15-31, and 34-35 have been considered but are moot in view of the new ground(s) of rejection.

Summary and Responses to Arguments

A. Applicant argues the rejection under 35 U.S.C. 103(a) as being unpatentable under Zenchelsky et al. in view of Spinney et al. for claims 1-10 and 22-29, as the references fail to teach the amended claimed limitations.

As to point A, applicant's arguments are moot in view of the new grounds of rejection under 35 U.S.C. 103(a) as being unpatentable under Zenchelsky et al, Spinney et al., and Sendrowicz. The prior art references Zenchelsky et al., Spinney et al., and Sendrowicz create a prima facie case of obviousness.

B. Applicant argues the rejection under 35 U.S.C. 103(a) as being unpatentable under Hughes et al. in view of Spinney et al. and further in view of Zaumen et al. for claims 11-15, as the references fail to teach the amended claimed limitations.

As to point B, applicant's arguments are moot in view of the new grounds of rejection under 35 U.S.C. 103(a) as being unpatentable under Hughes et al, Spinney et al., Zaumen et al. and Sendrowicz. The prior art references Hughes et al., Spinney et al., Zaumen et al., and Sendrowicz create a prima facie case of obviousness.

C. Applicant argues the rejection under 35 U.S.C. 103(a) as being unpatentable under Hughes et al., Spinney et al. in view of Zaumen et al., and further in view of Bass et al. for claims 16-21, as the references fail to teach the amended claimed limitations.

As to point B, applicant's arguments are moot in view of the new grounds of rejection under 35 U.S.C. 103(a) as being unpatentable under Hughes et al, Spinney et al., Zaumen et al., Sendrowicz, and Bass et al. The prior art references Hughes et al., Spinney et al., Zaumen et al., Bass et al. and Sendrowicz create a prima facie case of obviousness.

D. Applicant argues the rejection under 35 U.S.C. 103(a) as being unpatentable under Hughes et al. in view of Filters for claims 31-35, as the references fail to teach the amended claimed limitations.

As to point d, applicant's arguments are moot in view of the new grounds of rejection under 35 U.S.C. 103(a) as being unpatentable under Hughes et al, Filters, and Sendrowicz. The prior art references Hughes et al., Filters, and Sendrowicz create a prima facie case of obviousness.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Adam S. Weintrop whose telephone number is 571-270-

1604. The examiner can normally be reached on Monday through Friday 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Cardone can be reached on 571-272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AW 6/21/07

JASON CARDONE
SUPERVISORY PATENT EXAMINER